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THE PREVALENCE OF CHIROPRACTIC-SPECIFIC TERMINOLOGY ON SOUTH AFRICAN CHIROPRACTORS' WEBSITES.

A research dissertation presented to the Faculty of Health Sciences, University of Johannesburg, as partial fulfilment for the Master's degree in Technology, Chiropractic by

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27 November 2020

Supervisor: _____ Date:_____

Dr. C. Yelverton

Declaration

I declare that this thesis is my own, unaided work. It is being submitted for a Master's Degree at the University of Johannesburg. It has not been submitted before for any degree or examination at any other Technicon or University.

_____

(Signature of Candidate)

10th day of November 2020.

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Abstract

Introduction: Universal understanding of medical terminology is essential for proper communication between medical professionals. The importance of using common language when communicating with other health care professionals has been acknowledged in literature and is important to interdisciplinary understanding of back pain. Chiropractors commonly use words that have developed within their profession to convey specific concepts and beliefs. The primary aim of this study was to calculate the prevalence of nine chiropractic-specific words (subluxation, manipulate (-ion), adjust (-ing/-ment), holism (-tic), alignment, practice-member, vital (-ism/-istic), wellness, and innate intelligence) on the websites of South African chiropractors.

Method: There are 884 chiropractors registered with the Allied Health Professions Council of South Africa (AHPCSA). The assumption was made that 50% of them have websites. This gives us a population of 442 websites. Since the Google search does not pick up every single website, a sample size of 350 was used.

Procedure: The Google search engine was used to find chiropractors' websites by using the word "Chiropractor" + the name of each province eg. Gauteng. Once the website was opened, every tab and sub-tab was searched (using cmd F) for the nine specific words (subluxation, manipulate (-ion), adjust (-ing/-ment), holism (-tic), alignment, practice-member, vital (-ism/-istic), wellness, and innate intelligence), and the data was collected on an Excel spreadsheet. The context of each word was analysed before deciding whether it should be included. In order for a word to be included, it must have been used as chiropractic-specific, unique and with value.

Results: Gauteng, KwaZulu-Natal (KZN) and the Western Cape (n=101) all had valid percentages of 30.1% and cumulative percentages of 30.1%, 60.1% and 90.1% respectively. DUT (n=111) and UJ (n=113) had valid percentages of 44.8% and 45.6% and cumulative percentages of 44.8% and 90.3% respectively. Years of practice (n=98) had a mean of 13.83 years (SD± 8.97), a minimum of 1 and a maximum of 47. Adjustment (n=336) had a mean of 3.29 (SD±5.10) and a maximum of 47. This 47 is an outlier as it is much higher than the average use of the word. Manipulate (n=336) had a mean of 1.82 (SD±3,00) with a maximum of 24. Wellness (n=336) had a mean of 0.96 (SD±2.04) and a maximum of 11. Although this is a decimal, it is close to 1.00 and is relevant. The only words that were statistically significant were adjustment (p=0.001), holism (p=0.002)and practice-member (p=0.002). Adjustment (p=0.001), therefore the amount of times

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chiropractors in Gauteng used the word adjustment is more than that of chiropractors in KZN and is statistically significant. Holism (p=0.000), therefore the amount of times chiropractors in the Western Cape used the word Holism is more than that of chiropractors in Gauteng and is statistically significant. Practice-member (p=0,013), therefore the amount of times chiropractors in the Western Cape used the word practice-member is more than that of chiropractors in Gauteng and is statistically significant. Adjustment (p=0.000), therefore the amount of times chiropractors in the Western Cape used the word adjustment is more than that of chiropractors in KZN and is statistically significant. Practice-member (p=0,013) therefore the amount of times chiropractors in the Western Cape used the word practice-member is more than that of chiropractors in KZN and is statistically significant. The word manipulate was used more by males (mean=2,07) than by females (mean=1.65) (p=0.032). Adjustment was used more by UJ (mean - 4,12) than by DUT (mean – 3,24) (p=0,048).

Conclusion: This study found that all South African chiropractors on average use at least two chiropractic-specific words on their websites, that the more years of practice one has, the more likely one is to use more chiropractic-specific terminology and that the younger recently graduated chiropractors use less chiropractic specific terminology. This indicates that evidence-based education has made a difference in the way chiropractors communicate, and how much they use chiropractic-specific terminology.

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Dedication

To my family – Cas, Stella, Eloff, Jeanette, Jasper, Jesse, Sipho, Katya and Mannetjie for your endless help and support.

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Thank you to my supervisor, Dr Yelverton. I appreciate all the help and guidance that you have given me this year, especially with everything that has occurred in 2020.

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CHAPTER ONE: INTRODUCTION

1.1 The Problem Statement

Universal understanding of medical terminology is essential for proper communication between medical professionals. The importance of using common language when communicating with other health care professionals has been acknowledged in literature and is important to interdisciplinary understanding of back pain (Barker, Reid and Lowe, 2009). Brussee, Assendelft and Breen (2001) found that 40% of general practitioners recorded that chiropractors' feedback reports contained confusing terminology, and that it negatively impacted communication. This study concluded that the main factors that negatively impacted the way that general practitioners and chiropractors communicate were: the use of confusing terminology, limited knowledge of the chiropractic profession and previous bad experience with communication. A similar study in Australia found that an overwhelming majority of chiropractors in Australia used one or more chiropractic-specific terms or words on their websites (Young, 2020).

Chiropractors commonly use words that have developed within their profession to convey specific concepts and beliefs (Young, 2020). Chiropractic-specific terminology therefore poses a problem, as it affects the ability to understand a patient's diagnosis and/or treatment plan during multidisciplinary treatments and interdisciplinary referrals. Chiropractic-specific terminology used to be taught at chiropractic educational institutes in South Africa (RSA) for both historical context and practical use, however this is no longer the case. In 2014, the educational collaborative statement was signed by the two chiropractic educational institutes, DUT and UJ. This stated that chiropractic education must accept the biopsychosocial model of health-care, must have an evidence-based approach, and must use effective language that is clearly understood by all stakeholders in health-care (UJ.ac.za., 2020).

Chiropractic-specific terminology includes words like: subluxation, manipulate (-ion), adjust (-ing/-ment), holism (-tic), alignment, practice-member, vital (-ism/-istic), wellness, and innate intelligence. There is no

current literature on the prevalence of chiropractic-specific words used on South African chiropractors websites, and whether the educational collaborative statement has had an impact on the use of chiropractic-specific terminology. The prevalence of chiropractic-specific words can be an indication of how South African chiropractors communicate with other healthcare professionals, and possibly how to improve that communication.

1.2 Aim

The primary aim of this study was to calculate the prevalence of nine chiropractic-specific words (subluxation, manipulate (-ion), adjust (-ing/-ment), holism (-tic), alignment, practice-member, vital (-ism/-istic), wellness, and innate intelligence) on the websites of South African chiropractors.

The secondary aim of this study was to analyse and compare other biographic information including: education institute (University), gender, years of practice and province. This will allow us to compare the prevalence of chiropractic-specific terminology within each of the above demographic sub-headings.

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1.3 Possible Outcomes

This study might show whether there has been a change in the use of chiropractic-specific terminology in younger chiropractors, as a result of the educational collaborative statement. It might also show which chiropractic-specific words are the most prevalent in South Africa. This is important, as chiropractic-specific terminology can act as a language barrier furthering the gap between chiropractors and other health care professionals. Understanding the prevalence of these words, as well as the demographics, may lead to better communication between chiropractors and other health-care professionals.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter will consider the historical context surrounding the rise of chiropractic-specific terminology in an attempt to understand how and why it occurred, as well as an in depth study of each of the chiropractic-specific words used in this study. It is vital to understand what these words mean to chiropractors, where they get their meaning from and what they could mean to other health-care professionals.

Mutual understanding of back pain is essential for different practitioners to be able to work together (Barker, Reid and Lowe, 2009). Effective communication between different health care professions is very important for an effective interdisciplinary approach (Jette, 2006). A study in Australia found that a majority of Australian chiropractors used one or more chiropractic-specific terms on their websites (Young, 2020).

2.2 Chiropractic-specific Terminology

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2.2.1 Subluxation

The medical definition of subluxation is “a painful partial dislocation” and has been recognised as that since the time of Hippocrates (Homola, 2010). Throughout the history of chiropractic, the word subluxation has taken on many different meanings. “A subluxation of a joint, to a chiropractor means pressure on nerves, abnormal functioning creating a lesion in some portion of the body, either in its action of makeup” (Kent, 1996). This was the first definition of the word subluxation, defined by D.D Palmer and B.J Palmer. Subluxation appeared in published chiropractic literature for the first time in October 1903 in the first issue of Backbone magazine, although earlier that year D.D Palmer wrote to his son referring to a pinched nerve being the result of a subluxation (Gatterman, 2009).

D.D Palmer used many versions of the definition, but the main concept always revolved around the following:

1. Subluxation is a misalignment of a vertebra.
2. This causes pressure on the nerves exiting around the vertebrae.
3. This results in disease.

Therefore, removal of the subluxation causes a release of pressure and a restoration of health. The concept of the subluxation was central to the development of chiropractic as a profession (Vernon, 2010).

The Foundation for Chiropractic Education and Research later defined subluxation as "a motion segment in which alignment, movement integrity, and/or physiologic function are altered, although contact between the joint surfaces remains intact" (Homola, 2010). Today the subluxation complex is taught at many educational institutes with historical context only, and with no clinical value (Funk, Frisina-Deyo, Mirtz, and Perle, 2018).

Funk *et al. (2018)* conducted a study that looked at how often the word subluxation was found in chiropractic curricula throughout various countries. The rational for keeping the term subluxation consists of the following: professional identity, philosophy, technical, legal and accreditation (Keating *et al.*, 2005). It is argued that the vertebral subluxation complex is vital to the professional identity of chiropractic, and that without it chiropractors would just be seen as physical therapists who use spinal manipulative therapy (Funk *et al.*, 2018). The study found that 88% of American chiropractic educational institutes presented subluxation in their catalogues, while only 47% of non-American institutes used subluxation (Funk *et al.*, 2018). This is indicative that the importance of the subluxation as part of the professional identity of chiropractic varies by country and is not a constant for all. Subluxation is clearly important to North America, but not as important to the rest of the word, who are moving away from chiropractic's history as a philosophy and towards evidence-based practicing (Uj.ac.za., 2020).

When the speculative nature of a hypothesis or hypothetical construct is not made obvious, an otherwise acceptable proposition becomes a dogmatic claim. This is the history of subluxation within chiropractic

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(Keating *et al.*, 2005). Philosophical reasoning for keeping the term subluxation does not have any value: simply stated, the history of chiropractic must remain just that, history, and cannot be seen as a philosophy.

The accreditation rationale for keeping the subluxation is once again dependent on the country. In 2007, the accreditation standards set by the US Council on Chiropractic Education (CCE) included the word subluxation six times (Funk *et al.*, 2018), and in 2018 the word subluxation was found twice. It also stated that students must be able to identify a subluxation/segmental dysfunction/problem at a specific level of the spine (Council on Chiropractic Education, 2018). There is no mention of subluxation in the Council on Chiropractic Education Australasia (CCEA) or in the European Council on Chiropractic Education (ECCE). The subluxation is not based on sufficient evidence, and is not reproducible, therefore the ability to reproduce it should not be included in any graduate's competency. Instead, high evidence-based standards regarding patient care and integrating chiropractic into mainstream health-care is recommended (Funk *et al.*, 2018; Innes, Leboeuf-Yde and Walker, 2016).

With regards to the legal rationales for keeping the subluxation as a concept, whether or not subluxation is part of the legal scope of practice, which depends on each country's/state's laws: simply put politico-legal arguments and details do not confer scientific facts (Funk *et al.*, 2018).

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A more contemporary definition of the subluxation involves the dynamic and mechanical models. It states that a subluxation is an alteration to a spinal motion segment, causing changes in joint function and resulting in reduction of joint motion and joint play. This also includes changes in articular mechanics of the joint. The dynamic model suggests that spinal manipulative therapy or the chiropractic adjustment, frees the joint from the position it was fixed in, and has nothing to do with spinal segment alignment (Senzon, 2018).

This shows us that throughout the history of the chiropractic profession, new meaning has been given to pre-existing words, and changes have been made to give words their own meanings. This has resulted in a unique chiropractic-specific terminology that has no place in the health-care system, as it causes confusion and the spread of misinformation. It is therefore important that we analyse the use of chiropractic-specific terminology to better improve communication.

2.2.2 Manipulation

Manipulation is not a chiropractic-specific word, but a commonly accepted medical term.

Maitland's classification refers to a manipulation as a grade V mobilization. Grade I refers to oscillation with little force or depth. It is performed in the early portion of the available range of joint motion. Grade II refers to immobilization that incorporates an increased depth/degree of motion whilst remaining within the first half of the joint range of motion. Grade III mobilization involves deeper, more aggressive movement that is performed at the limits of motion. Grade IV mobilization is a deep, fine oscillation that is carried out at the limits of potential motion (Haldeman, Dagenals, Budgell, Grunnet-Nilsson, Hooper, Meeker, Triano, 2005). Grade V differs from I-IV by the application of speed and force and is sometimes accompanied by an audible click or pop known as a cavitation.

2.2.3 Adjust (-ing/-ment)

Chiropractic adjustment has been defined as a manual manipulation of a joint of the spine or any other body part, through which a controlled force is used. Others have defined a chiropractic adjustment as a low amplitude, high velocity manual thrust to a motion segment or joint. Within the chiropractic community the word 'adjustment' is a synonym for manipulation (Shekelle, Adams, Chassin, Hurwitz and Brook, 1992).

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Adjustment is a form of biomedical problem solving. It involves the controlled applications of forces and moments in an effort to restore normal function, alter tissue stress distribution, and reduce local or remote symptoms. Manipulation is generally referred to as a high velocity (speed), low amplitude (displacement) procedure that targets specific joints. There are many methods or techniques employed by chiropractors, including nonspecific long-lever techniques, specific short-lever techniques, toggle–recoil techniques, joint play techniques, traction-assisted methods, and various instrument-assisted methods (Haldeman, Dagenals, Budgell, Grunnet-Nilsson, Hooper, Meeker, Triano, 2005).

The effects of an adjustment are largely mechanical, including a realignment of joint surfaces, an increase in joint mobility, a reduction of muscle spasm, and an improvement of posture and locomotion. There are a number of other elements that could be involved. These include joint fixation or locking, intra-articular block, inter-articular adhesions, inter-discal block, muscle spasm, myofascial cycle, and periarticular fibrosis and

adhesions (Haldeman, Dagenals, Budgell, Grunnet-Nilsson, Hooper, Meeker, Triano, 2005). An adjustment is actually a manipulation, as research has not shown there to be a difference between the two. In fact, published literature only accepts manipulation, and not adjustment as a term.

2.2.4 Holism (-tic)

Holism is the philosophy which states that many parts of a whole are so interrelated that they cannot exist individualistically. The whole is regarded as greater than the sum of its parts. Holism has been useful to science, particularly biology, philosophy of mind, and linguistic (Woods, 2015).

Holism within medicine is not a new concept. Aristotle subscribed to a form of holism, and thus established one of the first responses to holism, known as reductionism (Woods, 2015). Holism in its most basic form states that the whole is greater than the sum of its parts (Gatterman, 1995). Holism is found in many medical professions and is built on the following principles:

1. The whole is larger than the sum of its parts.
2. The whole determines the nature of its parts.
3. The parts cannot be understood when in isolation from the whole.
4. The parts are dynamically interdependent (Gatterman, 1995).

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A more modern understanding of holism within medical professions understand it as: concerned with complete systems rather than with the analysis of, treatment of, or dissection into parts. Holism (-tic) is not a chiropractic-specific term. Holistic chiropractors approach treatment of their patients as a whole, not only their physical, but also mental and spiritual well-being. They believe that factors influencing the person do not occur in isolation. Holism within chiropractic emphasizes self-responsibility of patients for their health and the importance of mobilization of their health capacities, as supposed to just treating illness from the outside (Gatterman, 1995).

2.2.5 Alignment

The Cambridge Dictionary (2020) defines alignment as “An arrangement in which two or more things are positioned in a straight line or parallel to one another.” Historically chiropractors use this term relating to spinal segments in relation to one another with regards to which segment needs to be ‘adjusted/manipulated’ back into place.

Part of the chiropractic rationale was to be able to visualise the chiropractic subluxation, defined at the time as a bone out of place, irritating a nerve, and as a result causing disease. This model of radiography has survived in some parts of the chiropractic profession, despite it lacking evidence or clinical validity (Young, 2014). Chiropractic as a profession has a long history of biomechanical analysis of the spine through x-ray imaging. Early chiropractors used x-rays to study spinal alignment to identify the location of a ‘subluxated’ or misaligned vertebrae in order to correct the spinal alignment through the form of spinal manipulation (Jenkins, Downie, Moore and Simon, 2018). Measurements of intersegmental rotation, tilt and displacement were taken to analyse the overall alignment of the spine. A Post treatment x-ray would then be taken to measure the degree of change in alignment (Oakley, Cuttler and Harrison, 2018). The clinical relevance and usefulness of the above findings have not been sufficiently demonstrated, as many of the alternations in alignment can be due to anatomical variation, the positioning the patient is in during x-ray imaging, muscle spasms or even pain (Jenkins et al., 2018). Thus X-ray as a diagnostic tool has not been found to be a useful method to determine the location of a chiropractic subluxation or the location of spinal manipulation (Triano, et al, 2013).

Many chiropractors argue that x-ray imaging is still important for diagnosis of pathology, trauma, determining treatment options and screening patients for contra-indications. Common use of x-ray imaging to diagnose pathologies is not recommended, due to the rarity of pathologies presenting in clinical practice. Instead, the evidence informed consensus suggests referral for MRI and blood tests as the primary investigation for serious pathologies (Jenkins *et al.*, 2018). There is a lack of evidence showing that patient treatment options, based on radiographic findings, could not have been determined from the patients clinical history or physical

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exam (Jenkins *et al.*, 2018). MRI, rather than x-ray, have been found to be more useful when suspecting pathologies or contra-indication, due to its higher sensitivity and better diagnostic imaging quality. Without warning signs or red flags, no evidence showing that the use of x-ray imaging to asses structure or function, will improve clinical outcomes or benefit the patient (Corso *et al.*, 2020).

The latest guidelines for when diagnostic imaging should be used has been determined by the available evidence. It suggests taking x-rays only when there is suspicion of serious pathology, if imaging are likely to change and benefit the management plan, improve the patient outcomes, a decrease in patient harm or after 6 weeks of unresponsive treatment (Jenkins *et al.*, 2018).

The close relationship between the word 'alignment', when referring to spinal segments, and outdated non-evidence-based use of radiography is shown above. Chiropractic as a whole must move away from practicing methods of measuring alignment on x-rays, as it has not been found to be a useful method to determine the location of spinal manipulation (Triano *et al.*, 2013). Instead, radiographic imaging must only be used in accordance with the latest evidence-based guidelines.

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2.2.6 Practice-member

While not a word used by chiropractors exclusively, below is an explanation by a chiropractor as to why he chose to use the words 'practice-member' over the universally used and understood term 'patient'.

Nardi (2012) describes what a practice-member is and why he uses this term as supposed to the term patient. "We utilize the term practice-member because it best describes our ideal client. The term 'patient' isn't very fitting because, as in medicine, it insinuates a temporary nature. It gives the impression that our relationship is short term and predicated on something being 'wrong' with you. It implies the 'treatment' of symptoms and conditions, neither of which we do. Practice-member implies a relationship. Members know each other. Members are united for a reason, a purpose, a cause. Folks are members at golf and tennis clubs, gyms, and organizations whom they share a common bond with. Our common bond is that we are all here to live an innately guided life… or as close to that as possible."

The language used above is closer to that used in recreational activities, religious groups or cults. There is no medical or evidence-based reason for using this term, and it will result in confusion when communicating with other medical professionals.

2.2.7 Vital (-ism/-istic)

Vitalism refers to the theory that all living organisms are sustained by a vital life force that is both separate from and greater than normal physical or chemical forces. There are many ways of expressing this life force, some have called it Qi, energy, yin-yang, universal intelligence, or innate intelligence (Coulter and Willis, 2004).

Vitalism within the chiropractic context can be broken down into two sections: universal and individual. Historically, universal intelligence falls under the category of religion, including D.D. Palmer's views and attempts to relate his theories to the origins of life. This has been abandoned by most and seen as unscientific (Gatterman, 1995). Individual intelligence (innate intelligence according to D.D Palmer), was thought to be an expression of the universal within the body. D.D Palmer believed that innate intelligence was the body's ability to repair and regulate itself. Vitalism is the belief that the true origin of health comes from within the body through modulations of the nervous system (Gatterman, 1995).

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Vitalism is not a chiropractic-specific word but is used by many chiropractors. One of the important beliefs leads to a common phrase within vitalism, the whole is greater than the sum of its parts (Simpson and Young, 2020). Chiropractors also use this word as a synonym for Holism (-istic), to convey the idea that they view and treat patients as a whole. Vitalism is directly related to the chiropractic subluxation.

Vitalism within chiropractic context is the idea that a vertebra out of place is interrupting the flow of vital energy (innate intelligence) within the body and is the cause of disease or pain in the body. As stated above, this is an outdated and unscientific understanding of basic human anatomy and physiology.

Until chiropractic abandons this outdated ideology of vitalism, it will never become a genuine health-care profession. The language used by vitalistic chiropractors are outdated and simply unscientific. This use of language is not recognised by other health care professionals and creates a bigger divide between

chiropractic and other health care professionals. As long an vitalistic concepts remain within chiropractic, the profession will remain separated from mainstream health-care (Simpson and Young, 2020).

2.2.8 Wellness

Wellness can be defined as the development of ideal working and creative variation involving all aspects of life. Wellness is a lively progression in which an individual changes his/her conduct in a manner which encourages health in all its proportions (Hawk, 2005). Wellness-based chiropractic proposes an all-inclusive scope of practice and believes in the ability to address all facets of an individual's health. This is the way that chiropractors tie vitalism into the profession in a subtler way. Words and phrases like 'wellness', 'quality of life' and 'human potential' have roots in vitalism. Wellness-based chiropractors equate wellness to personal well-being, and aim to treat aspects of the patients' lives that go beyond the bodily symptomatology and include passionate, mystical and mental aspects of life (Villanueva-Russell, 2011).

Wellness also refers to the quality or state of being (with regards to one's health) as an actively sought goal. Wellness is not a chiropractic-specific term but is often used to promote healthy behaviours, as well as overall health in a more holistic manner. Wellness is used to describe healthy behaviour, for instance: decreased alcohol consumption and cessation of smoking (Young, 2020).

A study that looked at the number of referrals by medical doctors to chiropractors, found that chiropractors that had wellness/maintenance-based practices received fewer referrals than non-wellness-based chiropractors (Blanchette, Rivard, Dionne and Cassidy, 2015). Wellness/maintenance-based practices were also associated with practices that had aggressive marketing strategies and overtreated their patients (Blanchette *et al.*, 2015). Some chiropractors use it to imply chiropractic-specific benefits related to the removal of the subluxation complex (Young, 2020). Wellness-based chiropractic care cannot be defined as 'medically necessary' and claims to optimise the level of effectiveness and provides a process of realising the best life meaning and health (Taylor, 2011).

Taylor (2011) defines wellness care as: suitable treatment focused toward maintaining an ideal bodily function. This includes treatment of the symptomatic patient who has reached pre-clinical status, where their condition is resolved or unchanging, a routine for the patient's continued comfort and optimal state of health is maintained, and maintenance care was offered to patients that did not improve. Because of the multiple

uses of the term wellness in the literature, maintenance care and wellness care are used synonymously to represent the process of spinal manipulative therapy for an asymptomatic patient (Taylor, 2011).

Wellness-based chiropractic is just another form of vitalism. It is an ideology of care that does not align with the modern evidence-based care that the World Federation of Chiropractic (WFC) has outlined. This includes their new BE EPIC guidelines which include:

1. E – evidence-based.
2. P – patient-centred.
3. I – interprofessional.
4. C – collaborative (Brown and LI, 2018).

2.2.9 Innate Intelligence

Innate intelligence is a specific, definite portion of (Universal) intelligence, localized in a definite portion of matter and keeping it actively organized. Its function is to adapt to some of the forces and matter of the universe through a constructive manner. In humans, the point of control is the brain. Innate intelligence sends its controlling forces via the spinal cord through the spinal column, then through the nerve trunks emitting from the spinal cord and passing through the intervertebral foramina to the nerve. Adaptation of universal elements in the body depends on control by innate intelligence. Perfect adaptation results in health, and imperfect control results in disease (Haldeman, Dagenals, Budgell, Grunnet-Nilsson, Hooper, Meeker, Triano, 2005). Innate intelligence is part of the history of chiropractic philosophy but has no clinical or scientific value.

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2.3 A Shift in Terminology

With the changes that came about in 2014, as a result of South African and European educational institutions signing the educational collaboration document, there has been a shift away from many of these chiropractic-specific terminologies and a movement into evidence-based chiropractic education. The education collaborative document states that effective communication in a language clearly understood by all

stakeholders in health-care should be used to better communicate between health-care teams. It also states that the teaching of vertebral subluxation complex as a vitalistic construct that claims it is the cause of disease is unsupported by evidence and that its inclusion in a modern chiropractic curriculum in anything other than a historical context, is inappropriate and unnecessary (Uj.ac.za., 2020). The philosophy of chiropractic is now taught as being historically relevant only, with no clinical relevance. The change in education should be reflected in the terminology used by students who graduated after 2014.

2.3.1 Evidence-based Practice and Education

The inclusion of evidence-based practice (EBP) is recognised as a vital and necessary process for health professional training. Accreditation documents reflect the practice standards of health professions. EBP is defined as the integration of the best research evidence with clinical expertise, patient values, circumstances and has been accepted across most health professionals (Haynes, Sackett, Richardson, Rosenberg and Langley, 1997).

Responsible practise is considered to be evidence-based as it is safe and results in better patient care (Innes, Leboeuf-Yde and Walker, 2016). EBP has shown to decrease the length of time that patients spend in hospital, increases survival outcomes, improves the quality of care and treatment, and decreases financial pressure (Innes, Leboeuf-Yde and Walker, 2016). The use of EBP has been found to relate directly to the quality of the students' learning experience, and EBP competency has shown to be influenced by curriculum (Vidyarthi, Kamei, Chan, Goh and Ngee, 2015). There is evidence to suggest that adopting EBP in chiropractic education improves a student's perceived ability to deliver patient care (Fernandez and Delaney, 2004). It would then seem logical to assume that it is possible to include EBP as a requirement to educational standards designed and enforced by chiropractic regulatory or licensing agencies.

It seems logical that research would play an important role in developing EBP. Changes in education and training standards set by authorities have shown to have a positive effect on research in medical education if they:

1. Protect time for research.
2. Mandate mentorship and/or collaboration.
3. Ensure departmental and institutional commitment and leadership.
4. Are provided with adequate financial support (Ahmed, Farooq, Storie, Hartling and Oswald, 2016).

Nevertheless, the word research was more widely included in CCE educational standards. There appears to be uniform agreement that research is a core component to CCE educational standards. Chiropractic education and the profession has to continue to establish itself as a credible and mature health profession and there needs to be an emphasis on not just training skilled consumers of research, but also on facilitating increased numbers of the producers of research (April and Gaboury, 2013).

A study by Innes, Leboeuf-Yde and Walker (2016) did an audit of educational standard documents of the various Councils on Chiropractic Education (CCE). They identified the occurrences of terms related to EBP: evidence, evidence-based, research, subluxation and vitalism. Although they only found some references to the key words indicative of the presence of EBP, it was encouraging that the keyword "subluxation", which they considered an indicator of an inconsistent or incomplete adoption of EBP, was found only once and that "vitalism", in their opinion also an indicator of non-adoption of EBP, was absent in these standards (Innes, Leboeuf-Yde and Walker, 2016). They concluded that the absence of terms such as "subluxation" and "vitalism", and firm statements about their undesirability, may provide opportunities for aberrant chiropractic programs to be accredited (Innes, Leboeuf-Yde and Walker, 2016).

A survey of a North American chiropractic curriculum revealed that 11% of students agreed that all disease and pain is caused by a vertebral subluxation complex. They also believe that chiropractic spinal adjustments or manipulations are very effective treatments for conditions such as HIV, neoplasms, mental illness, otitis media, and even asthma (Gliedt, Briggs, Williams, Smith and Blampied, 2012). However, 3 in every 4 of these chiropractic students were found to rate evidence as more important than traditional chiropractic theory (vertebral subluxation complexes). If evidence is the most important determinant, how is it possible to have non-evidence-based or unfounded beliefs that appear biologically implausible? This suggests that either

students may not be taught how to recognize and understand the evidence, or that they are refusing to integrate evidence which is at odds with their perceived professional identity (Innes, Leboeuf-Yde and Walker, 2018). These findings suggest further research and a re-thinking on how chiropractic educators should go about their business to produce graduates who understand and deliver evidence-based health care and are capable of integrating into the mainstream health care system (Innes, Leboeuf-Yde and Walker, 2018).

We should regard evidence-based medicine as a constantly evolving foundation for optimizing clinical practice, rather than a new scientific or philosophical theory that changes the nature of medicine (Djulbegovic, Guyatt and Ashcroft, 2009). The accreditation council for graduate medical education requires medical students to demonstrate the ability to integrate scientific evidence. Similarly, an understanding of the principles of EBP and the application of evidence into practice is part of the core training both of medical doctors and complementary and alternative medicine health-care practitioners in the United Kingdom (Accreditation Council for Graduate Medical Education, 1999). A positive attitude toward EBP principles in health-care education may be one of the first steps for motivating a health-care professional student to later apply EBP principles in individual practice (Banzai *et al.*, 2011).

A study done by Banzai *et al.* (2011) looked at student attitudes, behaviours, and knowledge about EBP principles. They found that students had a positive attitude towards EBP, had some training in EBP or research methods in their chiropractic program, but did not demonstrate good knowledge in researching evidence-based principles. Given the positive attitude toward the value of EBP principles, the perceived need for additional EBP training, and the low level of knowledge demonstrated by respondents, it is surprising that half of respondents agreed they had enough time to search and read research literature. They concluded that students needed more training in EBP and based on their knowledge, they may need further training about basic research concepts (Banzai *et al.*, 2011).

As seen above, the issue with integrating more EBP comes down to education. A list of 41 EBP articles was compiled by a study using academic and research leaders in the chiropractic profession (Mansholt *et al.*, 2013). The purpose of this study was to survey leaders in the chiropractic profession on their opinions of

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essential literature for doctors of chiropractic, faculty and students to read or reference. Essential literature included basic science and clinical research, health policy statements and education-based articles. These articles included evidence on the effectiveness of manual therapies, the physiological underpinnings of spinal manipulation, risks relating to and associated with chiropractic care, and arguments for an expanded role for chiropractors within the health care system (Mansholt *et al.*, 2013). A shared knowledge base and peered reviewed literature will assist students and doctors of chiropractic to communicate with one another, their patients, and other health-care professionals. The impact and clinical importance of this essential literature for the chiropractic profession may also be influenced by the access clinicians have to scientific articles (Mansholt *et al.*, 2013).

The recommended literature might be broken down into three major categories:

1.) Foundational understanding of the pathophysiology underlying chiropractic concepts and practices.
2.) Importance of practitioner awareness of the state of the evidence for patient care and clinical practice.
3.) Potential societal impact fostering improved integration or acceptance (Mansholt *et al.*, 2013).

There is an increased expectation for health-care professions, including chiropractors, to adopt, include and use research-based knowledge and methodologies, while taking sufficient account of the quality of available research evidence to inform clinical practice. As a result, the Canadian Chiropractic Association and the Canadian Federation of Chiropractic Regulatory and Educational accrediting boards' clinical practice guidelines project developed guidelines for practice based on available evidence (Bryans *et al.*, 2011). This study was done by Bryans, Descarreaux, Duranleau, Marcoux, Potter, Ruegg, Shaw, Watkin and White (2011) and proposed to provide evidence-informed practice recommendations for the chiropractic treatment of headache in adults.

They applied systematic processes for literature searching, screening, review, analysis, and interpretation to compile the guidelines. They used only controlled clinical trials, randomized control trials and systematic reviews. Research was only considered to be of high evidence if multiple high quality randomized control

trials corroborated their findings. They found that evidence supported the use of spinal manipulation as treatment for migraines and cervicogenic headaches, but not for tension-type headaches. Multidisciplinary care, including massage and exercise, are also effective in treating migraines, while joint mobilization and deep flexor muscle exercises are effective in treating cervicogenic headaches (Bryans et al., 2011). This is just one example of evidence-based research being applied to the chiropractic profession to develop better clinical practice.

A study done by Innes and Kimpton (2020) compared the education standards and graduate competencies of 2009 and 2017, which include minimum expectations of graduates before they enter the workplace. The objectives of this study was:

1.) To compare the council on chiropractic education Australia's (CCEA) competency standards with their previous 2009 competency standards, in order to explore similarities and differences of prescribed recommendations.
2.) To comment on whether these changes are likely to be for the better or worse.
3.) And if possible, to make recommendations for improvement (Innes and Kimpton, 2020).

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The 2017 graduate competencies added the importance of avoiding the use of chiropractic-specific language, and no longer contain the requirements of chiropractic's professional special characteristics and major historical milestones. Words that increased in frequency in the 2017 graduate competencies that indicated a move toward a contemporary mainstream health care approach were: collaboration, evidence-based, professional, patient-centred and research. There was also an increase in the numbers of words that indicate a changed emphasis on the quality of patient care. This included: competence(-/y), confidentiality, demonstrate, safety, skills and quality(Innes and Kimpton, 2020).

They found that the CCE-A competency standards of 2017 moved in a positive direction and embraced standards of other widely accepted allied-health professions by adding expectations for managing chronic conditions, life- style issues, and embraced patient-centred care and self-management (Innes and Kimpton,

2020). An increase in the use of the term “evidence-based” has shown to be an indicator of the quality of accreditation standards and regulation that drastically increased in 2017. The competencies have shown to be patient-centred.

2.3.2 Continuous Evidence-based Clinical Development

With the increasing trend towards accountability between health care professionals, the demand for chiropractic to have essential competencies and effective treatment strategies, based on peer review literature, is growing. We now live in what is known as the ‘information age’, due to the exponential growth of information, and the fact that information has never been easier to share. Information is constantly changing as new research is done. It is therefore crucial that practitioners keep up to date with the latest research and acquire new skills to translate high volumes of data into improved patient results (Feise, Grod and Taylor-Vaisey, 2006)

As discussed above, an important way to integrate EBP into chiropractic is through the educational institutes and accreditation bodies. But what about chiropractors who have already been practicing for several years, and whose education did not include many EBP’s?

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For chiropractors to become effective evidence-based practitioners, they need focused educational programs that target specific competencies. Feise, Grod and Taylor-Vaisey (2006) saw the need for this, and developed a workshop for practitioners to learn fundamental skills required for practicing evidence-based health-care. Their aim was to develop and measure the effectiveness of evidence-based training for chiropractic practitioners in a continuing educational setting. They aimed to integrate scientific evidence by learning the following competencies:

1.) Articulation of clinically important questions.
2.) Locate and access relevant literature to address the questions.

3.) Critically appraise the literature for its usefulness and validity.
4.) And Utilize the results of assessments to improve patient management (Haynes, Sackett, Richardson, Rosenberg and Langley, 1997; Feise, Grod and Taylor-Vaisey, 2006).

They concluded that their intervention was effective in increasing knowledge about EBP (Feise, Grod and Taylor-Vaisey, 2006). Chiropractors using the EBP approach benefit from being able to:

1.) Be more effective and efficient.
2.) Deal with expanded demands for accountability.
3.) Manage rapidly expanding sources of information.
4.) Maintain professional competence.
5.) Provide an increased quality of care (Delaney and Fernandez,1999).

2.4 Conclusion

The above literature shows the history of chiropractic-specific terminology and how it has affected communication between chiropractors and other health-care professionals. It also shows the shift in terminology as result of a shift towards evidence-based chiropractic. It is important to understand the past in order to change the future with regards to better developing evidence-base chiropractic.

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CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter will explain exactly how this study was conducted.

3.2 Study Design

This was a quantitative study whereby specific sampling of websites that belong to South African qualified chiropractors was used.

3.2.1 Participant Recruitment

Websites that were used in this study were found using the Google search engine. 'Chiropractor' + the name of each province (Gauteng, KwaZulu-Natal, Free State, Limpopo, North West, Mpumalanga, the Western Cape, Northern Cape and Eastern Cape) were typed in the search engine to locate the websites (Young, 2020). The websites that meet the relevant inclusion and exclusion criteria will be used.

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3.2.2 Sample Selection and Size

There are 884 chiropractors registered with the Allied Health Professions Council of South Africa (AHPCSA). The assumption was made that 50% of them have websites (Young, 2020). This gives us a population of 442 websites. Since the Google search does not pick up every single website, a sample size of 350 was used. Google search results are not randomized, but favour websites with skilled marketing or sponsored advertisements. The sample size was big enough for this to not affect the study, because skilled marketing

strategies or sponsored advertisements would only change the order in which the researcher sees the websites. These websites will show up first on the list. However the order does not matter, since every website that is linked to the key words 'chiropractor' and each south African province 'Gauteng, KwaZulu-Natal, Free State, Limpopo, North West, Mpumalanga, the Western Cape, Northern Cape and Eastern Cape' was used in this study.

3.2.3 Inclusion Criteria

To be included in this study, the websites must have met the following criteria:

- It must be owned/used by a chiropractor who is registered with the AHPCSA.
- The websites must be used for the purpose of public information, education and location.
- Each website was cross-referenced with a list from the AHPCSA containing the names of all 884 registered chiropractors.
- It must be an official website and not a social media account.

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3.2.4 Exclusion Criteria

To be excluded from this study, the websites must have presented one of the following:

- A social media account used for the same purposes as a website.
- Belonging to an unregistered chiropractor.
- Belonging to or giving information of practices outside South Africa.

3.2.5 Randomization

The results from the Google search engine are not randomized, but favors websites with skilled marketing strategies or sponsored Google advertising. The sample size was big enough for this to not have an effect on the study. Skilled marketing strategies or sponsored advertisements would only change the order in which the researcher sees the websites. These websites will show up first on the list. However, the order in which the websites appeared does not matter, because every website that was linked to the key words 'chiropractor' and each South African province was used in this study.

3.3 Data Collection Approach

As previously stated, the Google search engine was used to find chiropractors' websites by using the word "Chiropractor" + the name of each province eg. Gauteng. Once the website was opened, every tab and sub-tab was searched (using cmd F) for the nine specific words (subluxation, manipulate (-ion), adjust (-ing/-ment), holism (-tic), alignment, practice-member, vital (-ism/-istic), wellness, and innate intelligence). This data was collected and organised on an Excel spreadsheet. The context of each word was analysed before deciding whether it should be included. In order for a word to be included, it must have been used as chiropractic-specific, and with value. Sentences that devalued the meaning of a chiropractic-specific word and rejected its chiropractic-specific meaning, whilst still using the word in a sentence, was not counted. E.g. "We treat vertebral subluxations" was counted, but "We believe the vertebral subluxation model is only a historical model and has no clinical value" was not counted (Young, 2020). Each website was also searched for any information regarding the practitioners' gender, age, educational institute and years of practice. Once all the data was collected, it was analysed and only the statistically relevant demographics were used.

Concerning websites with multiple chiropractors, each chiropractors' individual "Bio/about-us" section was searched and those numbers were only applied to that specific chiropractor. The results from searches on other tabs not including other bio/about-us sections, were also added to each chiropractor.

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3.4 Objective Data

The researcher collected objective data on a Microsoft Excel spreadsheet to represent the number of times each word is used (per website), which was arranged according to each province.

3.5 Data Analysis

The objective data was collected by the researcher, analyses were done with the assistance of STATKON at the University of Johannesburg.

The following statistical analyses was done:

Frequencies & descriptive statistics, including basic statistics, for example counts, percentages, means, standard deviations, minimums and maximums. Normality & comparisons to compare different groups of people (this includes comparisons of chiropractic-specific terminology within specific demographics, for instance different provinces, years of practice, gender, age and educational institute). For normality testing, either the Kolmogorov-Smirnov test or the Shapiro Wilk test was done, depending on the group sizes.

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For the comparisons between groups, where two groups where compared, the following tests were done: The Independent-Samples T-test (if the data is normally distributed) or the Mann-Whitney test (if the data is not normally distributed). For the comparisons between groups, where three or more groups were compared, the following tests were done: The One-way ANOVA (if the data is normally distributed) or the Kruskal-Wallis test (if the data is not normally distributed)

3.6 Ethical Considerations

The information that was collected in this study was free and open to the public. There was therefore no need for consent to be given by the website owners. Anonymity and confidentiality were ensured when compiling the research dissertation, as the website details were de-identified. As a result, an ethics waiver was granted (Annexure A). This was approved by the University of Johannesburg Research Ethics Committee and Higher Education Committee (HTC No. 01 – 45 - 2020). This research was run through anti-plagiarism software Turnitin (Appendix B) with a similarity index of 18%.

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CHAPTER FOUR: STATISTICS

4.1 Introduction

This chapter exhibits all the statistical data collected from websites belonging to or used by South African Chiropractors in this research study. Demographics relating to provinces, educational institute, and gender will be broken down and compared.

4.2 Demographical Data

4.2.1 Provincial Data

Gauteng, KwaZulu-Natal (KZN) and the Western Cape all had frequencies of 101. This is because they are the three most populated provinces in South Africa (Kramer, 2018). The fact that the frequencies are the same allows for proper comparisons between these three groups. As much data from the other provinces was collected, but unfortunately not enough was collected for equal comparisons.

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Gauteng, KZN and the Western Cape (n=101) all had valid percentages of 30.1%, and cumulative percentages of 30.1%, 60.1% and 90.1% respectively. The Eastern Cape (n=17), North West (n=4) and Northern Cape (n=2) had valid percentages of 5.1%, 1.2% and 0.6 %, and a cumulative percentage of 95.2,% 96.4% and 97.0%, respectively. The Free State (n=4), Mpumalanga (n=3) and Limpopo (n=3) had valid percentages of 1.2%, 0.9% and 0.9%, and cumulative percentages of 98.2%, 99.1% and 100.0%, respectively.

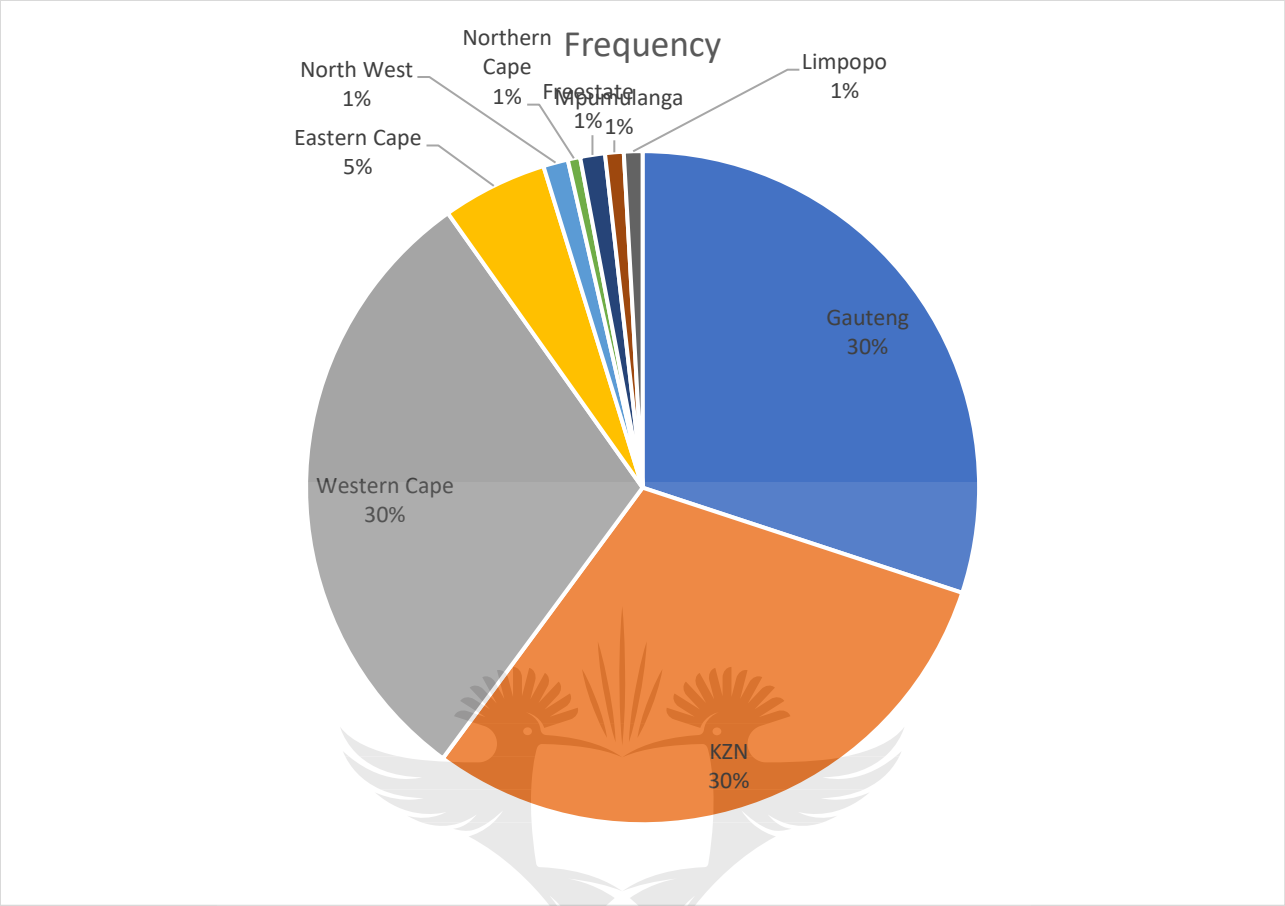

FIGURE 4. 1 PIE CHART SHOWING PROVINCIAL DISTRIBUTION

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4.2.2 Gender Distribution

The combined sample, consisting of male (n=169) and female (n=119), had valid percentages of 58.7% and 41.3%, and cumulative percentages of 58.7% and 100%, respectively. Missing data included a frequency of 48, a percentage of 14.3% with a total frequency of 336.

TABLE 4.1 TABLE SHOWING GENDER DISTRIBUTION 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	169	50,3	58,7	58,7

	Female	119	35,4	41,3	100,0
	Total	288	85,7	100,0	
Missing	System	48	14,3		
Total		336	100,0		

4.2.3 Educational Institute Distribution

Due to the fact that the study was done in South Africa, there will understandably be more chiropractors who have qualified at one of the two South African chiropractic educational institutes. DUT (n=111) and UJ (n=113) had valid percentages of 44.8% and 45.6% and cumulative percentages of 44.8% and 90.3%, respectively. Chiropractic educational institutes in the USA (n=21) and UK (n=3) had valid percentages of 8.5% and 1.2%, and cumulative percentages of 98.8% and 100.0%, respectively. Missing data included frequencies of 88, with a percentage of 26.2% and a total frequency of 336.

TABLE 4.2 TABLE SHOWING UNIVERSITY DISTRIBUTION 1

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		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	DUT	111	33,0	44,8	44,8
	UJ	113	33,6	45,6	90,3
	Educational Institutes in the USA	21	6,3	8,5	98,8
	Educational Institutes in the UK	3	0,9	1,2	100,0
	Total	248	73,8	100,0	
Missing	System	88	26,2		

Total		336	100,0		

4.3 Results of Statistical Data

Years of practice (n=98) had a mean of 13.83 years (SD± 8.97), a minimum of 1 and a maximum of 47. Adjustment (n=336) had a mean of 3.29 (SD±5.10) and a maximum of 47. This 47 is an outlier, as it is much higher than the average use of the word. Manipulate (n=336) had a mean of 1.82 (SD±3,00) with a maximum of 24. Wellness (n=336) had a mean of 0.96 (SD±2.04) and a maximum of 11. Although this is a decimal, it is close to 1.00 and is relevant.

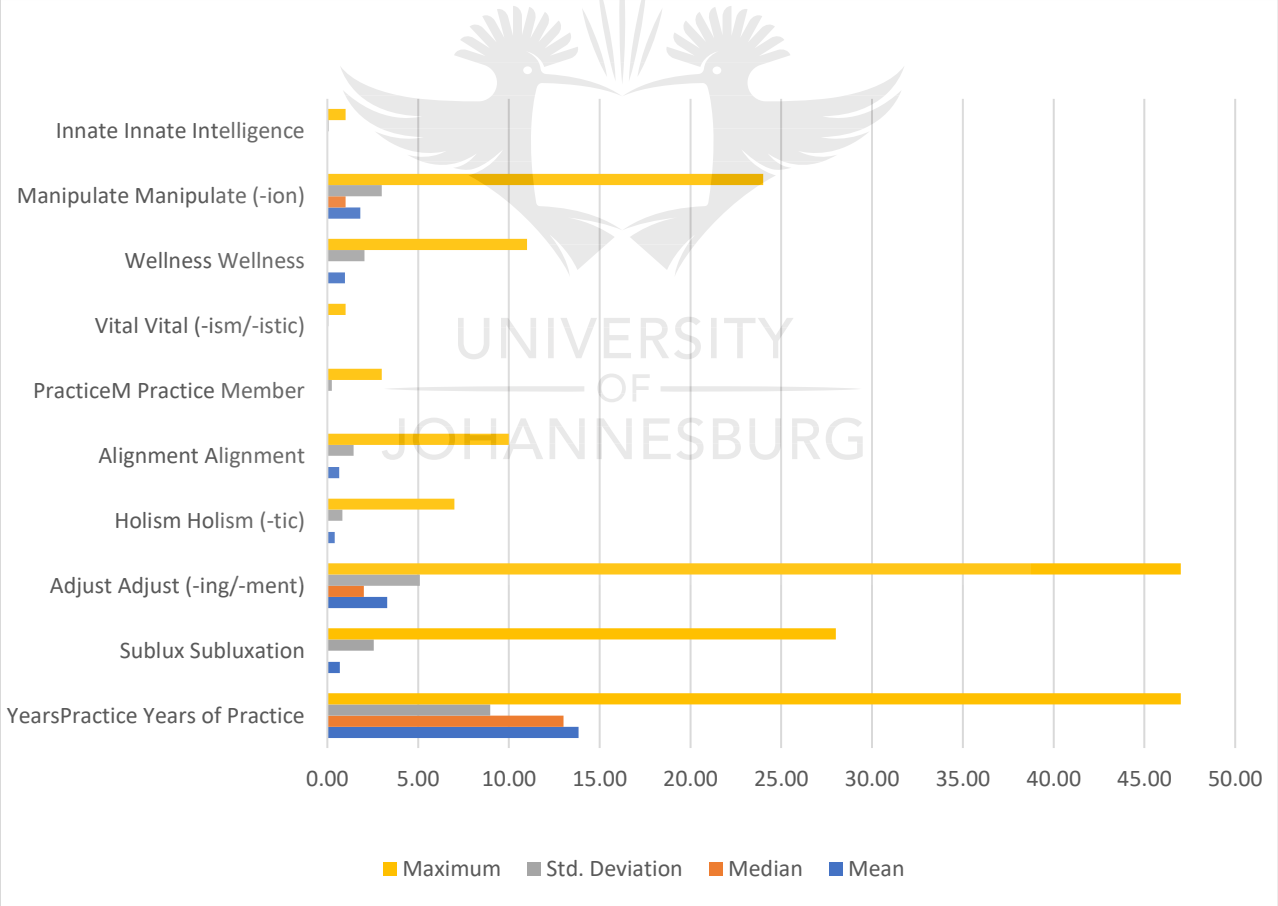

FIGURE 4. 2 BAR GRAPH SHOWING MEAN, MEDIAN, MAXIMUM AND STAND DEVIATION.

4.4 Test for Normality of Provinces

Due to the nature of the provincial groups being more than 50, the Kolmogorov-Smirnov Test for normality was used. This tests the distribution of the valuables to determine whether further parametric or non-parametric testing need to be done. All the P≤0.05, which means the data is not normally distributed.

TABLE 4.3 TABLE SHOWING TEST FOR NORMALITY OF PROVINCES 1

Province		Statistic	df	Sig./p-value
Subluxation	Gauteng	0,436	101	0,000
	KZN	0,459	101	0,000
	Western Cape	0,405	101	0,000
Adjust	Gauteng	0,277	101	0,000
	KZN	0,285	101	0,000
	Western Cape	0,214	101	0,000
Holism	Gauteng	0,488	101	0,000
	KZN	0,427	101	0,000
	Western Cape	0,311	101	0,000
Alignment	Gauteng	0,347	101	0,000
	KZN	0,423	101	0,000
	Western Cape	0,379	101	0,000
Practice-member	Gauteng		101	
	KZN		101	
	Western Cape	0,526	101	0,000
Vitalism	Gauteng		101	

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	KZN		101	
	Western Cape	0,530	101	0,000
Wellness	Gauteng	0,391	101	0,000
	KZN	0,400	101	0,000
	Western Cape	0,349	101	0,000
Manipulate	Gauteng	0,272	101	0,000
	KZN	0,276	101	0,000
	Western Cape	0,276	101	0,000
Innate	Gauteng	0,536	101	0,000
	KZN		101	
	Western Cape		101	

4.5 Comparison Between Provinces

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Although the group sizes where large enough for parametric testing, non-parametric testing was utilised because the data is skewed. The Kruskal-Wallis test was used for comparison between 3 groups.

Adjustment in Gauteng (n=101) had a mean of 3.77 (SD± 6.36), mean rank of 163,00 and median of 2.00. Adjustment in KZN (n=101) had a mean of 2.32 (SD± 4.06), mean rank of 125,34 and median of 0.00. Adjustment in the Western Cape (n=101) had a mean of 3.77 (SD± 4.76), mean rank of 167,66 and median of 2.00. This data shows us that chiropractors in Gauteng and the Western Cape (mean=3.77) use the word adjustment more than in KZN (mean=2.32).

Wellness in Gauteng (n=101) had a mean of 0.56 (SD± 1.03), mean rank of 146,85 and median of 0.00. Wellness in KZN (n=101) had a mean of 0.69 (SD± 1.50), mean rank of 143,32 and median of 0.00. Wellness

in the Western Cape (n=101) had a mean of 1.29 (SD± 2.44), mean rank of 165,83 and median of 0.00. This data shows us that chiropractors in the Western Cape (mean=1.29) use the word wellness more than chiropractors in Gauteng (mean=0.56) and KZN (mean=0.69).

Manipulate in Gauteng (n=101) had a mean of 1.78 (SD± 2.85), mean rank of 156,26 and median of 1.00. Manipulate in KZN (n=101) had a mean of 1.44 (SD± 2.08), mean rank of 146,05 and median of 0.00. Manipulate in the Western Cape (n=101) had a mean of 2.08 (SD± 3.19), mean rank of 153,69 and median of 0.00. This data shows us that chiropractors in the Western Cape (mean=2.08) use the word manipulate more than chiropractors in Gauteng (mean=1.78) and KZN (mean=1.44).

TABLE 4.4 TABLE SHOWING MEAN, STANDARD DEVIATION, MEAN RANK AND MEDIAN COMPARISON BETWEEN PROVINCIAL GROUPS 1

		N	Mean	Std. Deviation	Mean rank	Median
Subluxation	Gauteng	101	0,47	2,841	145,26	0,00
	KZN	101	0,60	2,030	151,08	0,00
	Western Cape	101	0,78	2,500	159,65	0,00
	Total	303	0,62	2,475		
Adjust	Gauteng	101	**3,77**	6,362	163,00	2,00
	KZN	101	**2,32**	4,069	125,34	0,00
	Western Cape	101	**3,77**	4,766	167,66	2,00
	Total	303	3,29	5,185		
Holism	Gauteng	101	0,21	0,454	134,74	0,00
	KZN	101	0,45	0,830	151,57	0,00

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	Western Cape	101	0,64	1,119	169,69	0,00
	Total	303	0,43	0,862		
Alignment	Gauteng	101	0,77	1,612	159,59	0,00
	KZN	101	0,42	1,070	141,80	0,00
	Western Cape	101	0,75	1,652	154,61	0,00
	Total	303	0,65	1,473		
Practice-Member	Gauteng	101	0,00	0,000	149,00	0,00
	KZN	101	0,00	0,000	149,00	0,00
	Western Cape	101	0,10	0,458	158,00	0,00
	Total	303	0,03	0,268		
Vitalism	Gauteng	101	0,00	0,000	151,50	0,00
	KZN	101	0,00	0,000	151,50	0,00
	Western Cape	101	0,01	0,100	153,00	0,00
	Total	303	0,00	0,057		
Wellness	Gauteng	101	**0,56**	1,034	146,85	0,00
	KZN	101	**0,69**	1,508	143,32	0,00
	Western Cape	101	**1,29**	2,443	165,83	0,00
	Total	303	0,85	1,784		
Manipulate	Gauteng	101	**1,78**	2,855	156,26	1,00
	KZN	101	**1,44**	2,080	146,05	0,00
	Western Cape	101	**2,08**	3,199	153,69	0,00

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	Total	303	1,77	2,755		
Innate Intelligence	Gauteng	101	0,02	0,140	154,00	0,00
	KZN	101	0,00	0,000	151,00	0,00
	Western Cape	101	0,00	0,000	151,00	0,00
	Total	303	0,01	0,081		

In order to perform the between group analysis, the Kruskal-Wallis test was required to analyze the data. If $P \geq 0.05$, there is no statistical difference between groups or provinces. If $P \leq 0.05$, there is a statistical difference between groups or provinces.

The only words that were statistically significant were adjustment (p=0.001), holism (p=0.002) and practice-member (p=0.002).

TABLE 4.5 TEST STATISTICS, KRUSKAL-WALLIS H, DEGREES OF FREEDOM AND ASYMP. SIG (P-VALUE)1

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	Kruskal-Wallis H	df	Asymp. Sig./ p-value
Subluxation	3,251	2	0,197
Adjust	14,947	2	**0,001**
Holism	12,671	2	**0,002**
Alignment	3,493	2	0,174
Practice-member	12,201	2	**0,002**
Vitalism	2,000	2	0,368
Wellness	5,423	2	0,066

Manipulate	0,843	2	0,656
Innate	4,013	2	0,134

Gauteng and the Western Cape used the word adjust an average of 3.77 times per website, where as KZN only uses it an average of 2.32 times per website. Gauteng used the word holism an average of 0.21 times per website, versus KZN using it 0.45 and the Western Cape at 0.64 times per website. Gauteng and KZN used practice-member 0.00 times, whereas the Western Cape used it 0.10 times per website.

Post-Hoc test was done to determine where the differences between the groups lie. This tests Gauteng versus the Western Cape, Gauteng versus KZN and then KZN versus the Western Cape. Bonferroni Adjustment / Correction was performed to test the P-values against a significance level of 0.05 / 3 = 0.0167. Only if P≤ 0.0167, then there is a statistically relevant difference.

4.5.1 Gauteng vs KZN

The Mann-Whitney test was performed for non-parametric testing to compare the 2 groups.

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Adjustment (p=0.001), therefore the amount of times chiropractors in Gauteng used the word adjustment is more than that of chiropractors in KZN and is statistically significant.

TABLE 4.6 COMPARISON BETWEEN GAUTENG AND KZN 1

Province		N	Mean Rank	Sum of Ranks	Mean	Asymp. Sig./ p-value (2-tailed)
Adjust	Gauteng	101	114,21	11535,50	**3.77**	
	KZN	101	88,79	8967,50	**2.32**	

	Total	202				**0,001**
Holism	Gauteng	101	96,10	9706,00	0.21	
	KZN	101	106,90	10797,00	0.45	
	Total	202				0,075
Practice-member	Gauteng	101	101,50	10251,50	0.00	
	KZN	101	101,50	10251,50	0.00	
	Total	202				1,000

4.5.2 Gauteng vs the Western Cape

The Mann-Whitney test was performed for non-parametric testing to compare the 2 groups.

Holism (p=0.000), therefore the amount of times chiropractors in the Western Cape used the word Holism is more than that of chiropractors in Gauteng and is statistically significant.

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Practice-member (p=0,013), therefore the amount of times chiropractors in the Western Cape used the word practice-member is more than that of chiropractors in Gauteng and is statistically significant.

TABLE 4.7 COMPARISON BETWEEN GAUTENG AND THE WESTERN CAPE 1

Province		N	Mean Rank	Sum of Ranks	Mean	Asymp. Sig./ p-value (2-tailed)
Adjust	Gauteng	101	99,79	10078,50	3,77	
	Western Cape	101	103,21	10424,50	3,77	

	Total	202				0,673
Holism	Gauteng	101	89,64	9054,00	**0,21**	
	Western Cape	101	113,36	11449,00	**0.64**	
	Total	202				**0,000**
Practice-member	Gauteng	101	98,50	9948,50	**0,00**	
	Western Cape	101	104,50	10554,50	**0,10**	
	Total	202				**0,013**

4.5.3 KZN vs the Western Cape

The Mann-Whitney test was performed for non-parametric testing to compare 2 groups.

Adjustment (p=0.000), therefore the amount of times chiropractors in the Western Cape used the word adjustment is more than that of chiropractors in KZN and is statistically significant.

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Practice-member (p=0,013) therefore the amount of times chiropractors in the Western Cape used the word practice-member is more than that of chiropractors in KZN and is statistically significant.

TABLE 4.8 COMPARISON BETWEEN KZN AND THE WESTERN CAPE 1

Province		N	Mean Rank	Sum of Ranks	Mean	Asymp. Sig./ p-value (2-tailed)
Adjust	KZN	101	87,55	8842,50	**2,32**	

	Western Cape	101	115,45	11660,50	**3,77**	
	Total	202				**0,000**
Holism	KZN	101	95,67	9662,50	0,45	
	Western Cape	101	107,33	10840,50	0,64	
	Total	202				0,091
Practice-member	KZN	101	98,50	9948,50	**0,00**	
	Western Cape	101	104,50	10554,50	**0,10**	
	Total	202				**0,013**

4.6 Test for Normality of Gender

Due to the sample of the gender groups being more than 50, the Kolmogorov-Smirnov Test for normality was used. This tests the distribution of the valuables, to determine whether further parametric or non-parametric testing needs to be done. All the P≤ 0.05, which means the data is not normally distributed.

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TABLE 4.9 TEST FOR NORMALITY FOR GENDER 1

Gender		Statistic	df	Sig./ p-value
Subluxation	Male	0,404	169	0,000
	Female	0,461	119	0,000
Adjust	Male	0,233	169	0,000
	Female	0,278	119	0,000
Holism	Male	0,397	169	0,000

	Female	0,412	119	0,000
Alignment	Male	0,375	169	0,000
	Female	0,343	119	0,000
Practice-M	Male	0,532	169	0,000
	Female	0,535	119	0,000
Vital	Male	0,525	169	0,000
	Female		119	
Wellness	Male	0,329	169	0,000
	Female	0,336	119	0,000
Manipulate	Male	0,249	169	0,000
	Female	0,286	119	0,000
Innate	Male	0,525	169	0,000
	Female	0,528	119	0,000

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Non-parametric testing was done for comparison between genders. The Mann-Whitney Test was used because comparison between two groups was done.

Manipulate among males (n=169) had a mean of 2,07 (SD± 3,048), mean rank of 152,88 and median of 1,00. Manipulate among females (n=119) had a mean of 1,65 (SD± 2,901), mean rank of 132,60 and median of 0,00.

TABLE 4.10 N, STD. DEVIATION, MEAN RANK AND MEDIAN FOR GENDER DISTRIBUTION 1

Gender		N	Std. Deviation	Mean Rank	Median
Subluxation	Male	169	3,351	149,63	0,00
	Female	119	1,277	137,22	0,00
Adjust	Male	169	5,232	149,57	2,00
	Female	119	5,184	137,31	2,00
Holism	Male	169	0,845	147,32	0,00
	Female	119	0,905	140,50	0,00
Alignment	Male	169	1,434	141,34	0,00
	Female	119	1,601	148,98	0,00
Practice-M	Male	169	0,334	144,57	0,00
	Female	119	0,129	144,40	0,00
Vital	Male	169	0,077	144,85	0,00
	Female	119	0,000	144,00	0,00
Wellness	Male	169	2,340	144,85	0,00
	Female	119	1,791	144,00	0,00
Manipulate	Male	169	3,048	152,88	1,00
	Female	119	2,901	132,60	0,00
Innate	Male	169	0,077	144,35	0,00
	Female	119	0,092	144,71	0,00

The only statistically significant difference in gender distribution was for the use of the word manipulate. The word manipulate was used more by males (mean=2,07) than by females (mean=1.65) (p=0.032).

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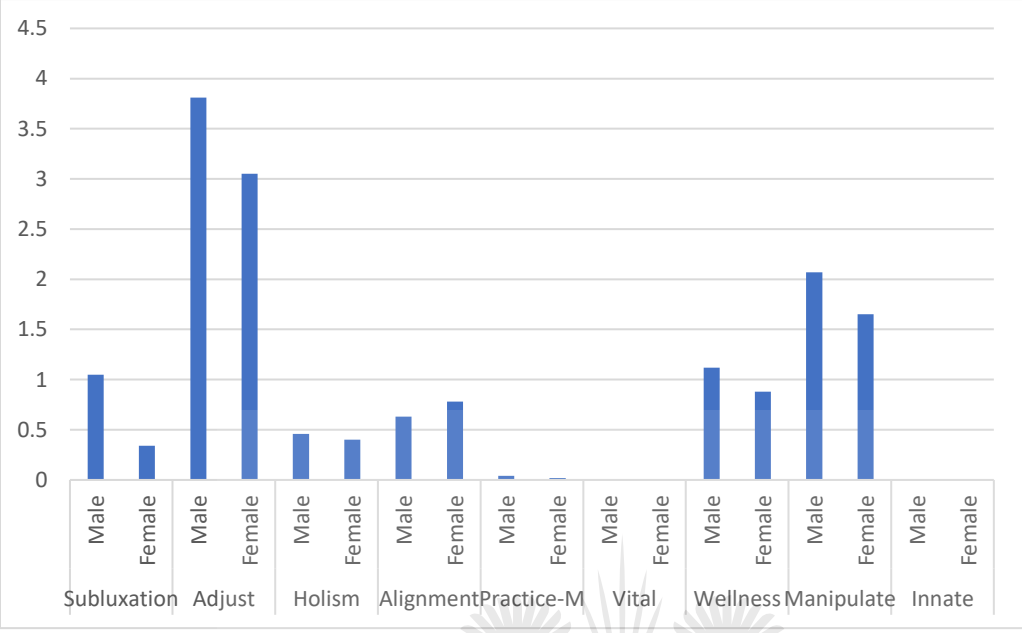

FIGURE 4. 3 BAR GRAPH SHOWING MEAN FOR GENDER DISTRIBUTION.

TABLE 4.11 MANN-WHITNEY U, WILCOXON W, 1

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig./ p-value (2-tailed)
Subluxation	9189,000	16329,000	-1,830	0,067
Adjust	9199,500	16339,500	-1,253	0,210
Holism	9579,500	16719,500	-0,861	0,389
Alignment	9522,000	23887,000	-0,933	0,351
Practice-M	10044,000	17184,000	-0,073	0,942
Vital	9996,000	17136,000	-0,839	0,401
Wellness	9982,500	17122,500	-0,123	0,902
Manipulate	8639,500	15779,500	-2,141	**0,032**
Innate	10030,500	24395,500	-0,250	0,803

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4.7 Test for Normality of Educational Institutes

Due to the sample of the university groups being more than 50, the Kolmogorov-Smirnov test for normality was used. This tests the distribution of the valuables to determine whether further parametric or non-parametric testing need to be done. All the P≤ 0.05, which means the data is not normally distributed.

TABLE 4.12 TEST FOR NORMALITY FOR UNIVERSITY'S 1

University		Statistic	df	Sig./ p-value
Sublux	DUT (Durban University of Technology)	0,434	111	0,000
	UJ	0,436	113	0,000
Adjust	DUT (Durban University of Technology)	0,257	111	0,000
	UJ	0,255	113	0,000
Holism	DUT (Durban University of Technology)	0,394	111	0,000
	UJ	0,400	113	0,000
Alignment	DUT (Durban University of Technology)	0,354	111	0,000
	UJ	0,368	113	0,000
PracticeM	DUT (Durban University of Technology)	0,530	111	0,000
	UJ		113	
Vital	DUT (Durban University of Technology)	0,529	111	0,000
	UJ		113	
Wellness	DUT (Durban University of Technology)	0,325	111	0,000

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	UJ	0,344	113	0,000
Manipulate	DUT (Durban University of Technology)	0,260	111	0,000
	UJ	0,263	113	0,000
Innate	DUT (Durban University of Technology)		111	
	UJ	0,535	113	0,000

TABLE 4.13 N, MEAN STD. DEVIATION, MEAN RANK AND MEDIAN FOR UNIVERSITY DISTRIBUTION

University		N	Mean	Std. Deviation	Mean Rank	Median
Subluxation	DUT	111	0,78	2,325	116,35	0,00
	UJ	113	0,43	2,676	108,72	0,00
Adjust	DUT	111	**3,24**	4,503	103,98	**1,00**
	UJ	113	**4,12**	6,250	120,87	**3,00**
Holism	DUT	111	0,50	0,819	117,36	0,00
	UJ	113	0,40	0,987	107,73	0,00
Alignment	DUT	111	0,59	1,140	114,28	0,00
	UJ	113	0,66	1,521	110,75	0,00
Practice-M	DUT	111	0,05	0,313	114,03	0,00
	UJ	113	0,00	0,000	111,00	0,00
Vital	DUT	111	0,01	0,095	113,01	0,00
	UJ	113	0,00	0,000	112,00	0,00
Wellness	DUT	111	1,09	2,263	114,25	0,00
	UJ	113	0,77	1,564	110,78	0,00

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Manipulate	DUT	111	1,98	2,601	111,36	1,00
	UJ	113	2,42	3,805	113,62	1,00
Innate	DUT	111	0,00	0,000	111,50	0,00
	UJ	113	0,02	0,132	113,48	0,00

Adjust (DUT) (n=111) had a mean of 3,24 (SD± 4,503), mean rank of 103,98 and median of 1,00. Adjust (UJ) (n=113) had a mean of 4,12 (SD± 6,250), mean rank of 120,87 and median of 3,00.

TABLE 4.14 MANN-WHITNEY U, WILCOXON W, Z AND P-VALUES 1

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig./p-value (2-tailed)
Subluxation	5844,000	12285,000	-1,349	0,177
Adjust	5325,500	11541,500	-1,980	**0,048**
Holism	5732,000	12173,000	-1,390	0,164
Alignment	6074,000	12515,000	-0,494	0,621
Practice-M	6102,000	12543,000	-1,755	0,079
Vital	6215,000	12656,000	-1,009	0,313
Wellness	6077,000	12518,000	-0,472	0,637
Manipulate	6145,500	12361,500	-0,269	0,788
Innate	6160,500	12376,500	-1,405	0,160

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The only statistically significant difference in University distribution was for the use of the word adjustment. Adjustment was used more by UJ (mean - 4,12) than by DUT (mean – 3,24) (p=0,048).

4.8 Normality and Correlations

Testing for normality of the whole sample was done to correlate it with years of practice. The Kolmogorov-Smirnov test was used because the sample was bigger than 50. Parametric Pearson correlation and non-parametric Spearman's Rho correlations were done. Spearman's Rho correlations will be reported due to the data being skewed to one side. The P-value < 0,05 for there to be a statistically significant correlation. If there is a correlation, the correlation coefficient will be reported to determine the strength of the correlation and whether the correlation is positive or negative.

4.9 Correlations

4.9.1 Years of Practice

There is a correlation between years of practice (n=98) and adjustment with a Spearman's Rho Correlation Coefficient of rs=0.220, (p=0.027). A positive correlation indicates that the more years of practice, the more adjustment was used. Although not a strong correlation, it is still a statistically significant one.

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There is also a correlation between years of practice (n=98) and alignment with a Spearman's Rho Correlation Coefficient of rs=0.339, (p=0.001). A positive correlation indicates that the more years of practice, the more alignment was used. This is considered a moderately strong correlation, and is statistically significant.

TABLE 4.15 CORRELATION BETWEEN YEARS OF PRACTICE 1

		Adjust	Alignment
Years-Practice	Correlation Coefficient	0.220	0.339
	P-value	**0,029**	**0,001**
	N	98	98

4.9.2 Subluxation

There is a correlation between subluxation (n=336) and adjustment with a Spearman's Rho Correlation Coefficient of rs=0.509, (p=0.000). A positive correlation indicates that the more subluxation was used, the more adjustment was used. Spearman's Rho Correlation Coefficient of rs=0.509 is considered to be a strong correlation, and is statistically significant.

There is a correlation between subluxation (n=336) and alignment with a Spearman's Rho Correlation Coefficient of rs= 0.379,(p=0.000). A positive correlation indicates that the more subluxation was used, the more alignment was used. This is considered to be a moderately strong correlation, and is statistically significant.

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There is a correlation between subluxation (n=336) and wellness with a Spearman's Rho Correlation Coefficient of rs=0.177, (p=0.001). A positive correlation indicates that the more subluxation was used, the more wellness was used. Although there is a correlation, a Spearman's Rho Correlation Coefficient rs=0.177 is considered to be a very weak correlation, and is statistically significant.

There is a correlation between subluxation (n=336) and manipulate, with a Spearman's Rho Correlation Coefficient of rs=0.123, (p=0.025). A positive correlation indicates that the more subluxation was used, the

more manipulate was used. Although there is a correlation, a Spearman's Rho Correlation Coefficient rs=0.123 is considered to be a very weak correlation, and is statistically significant.

TABLE 4.16 CORRELATIONS BETWEEN SUBLUXATION. 1

		Adjust	Alignment	Wellness	Manipulate
Subluxation	Correlation Coefficient	0.509	0.379	0.177	0.123
	P-value	**0,000**	**0,000**	**0,001**	**0,025**
	N	336	336	336	336

4.9.3 Adjustment

There is a correlation between adjustment (n=336) and alignment with a Spearman's Rho Correlation Coefficient of rs=0.418, (p=0.000). A positive correlation indicates that the more adjustment was used, the more alignment was used. A Spearman's Rho Correlation Coefficient rs=0.418 is considered to be a moderately strong correlation, and is statistically significant.

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There is a correlation between adjustment (n=336) and manipulate with a Spearman's Rho Correlation Coefficient of rs=0.388, (p=0.000). A positive correlation indicates that the more adjustment was used, the more manipulate was used. A Spearman's Rho Correlation Coefficient rs=0.388 is considered to be a moderately strong correlation, and is statistically significant.

TABLE 4.17 CORRELATIONS BETWEEN ADJUST 1

		Alignment	Manipulate
Adjust	Correlation Coefficient	0.418	0.388
	P-value	**0,000**	**0,000**
	N	336	336

4.9.4 Holism

There is a correlation between holism (n=336) and wellness with a Spearman's Rho Correlation Coefficient of rs=0.195, (p=0.000). A positive correlation indicates that the more holism was used, the more wellness was used. Although there is a correlation, a Spearman's Rho Correlation Coefficient rs=0.195 is considered to be a very weak correlation, and is statistically significant.

There is a correlation between holism (n=336) and manipulate with a Spearman's Rho Correlation Coefficient of rs=0.138, (p=0.011). A positive correlation indicates that the more holism was used, the more manipulate was used. Although there is a correlation, a Spearman's Rho Correlation Coefficient rs=0.138 is considered to be a very weak correlation, and is statistically significant.

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TABLE 4.18 CORRELATIONS BETWEEN HOLISM. 1

		Wellness	Manipulate
Holism	Correlation Coefficient	0.195	0.138
	P-value	**0,000**	**0,011**
	N	336	336

4.8.5 Alignment

There is a correlation between alignment (n=336) and wellness with a Spearman's Rho Correlation Coefficient of rs=0.178, (P=0.001). A positive correlation indicates that the more alignment was used, the more wellness was used. Although there is a correlation, a Spearman's Rho Correlation Coefficient rs=0.178 is considered to be a very weak correlation, and is statistically significant.

There is a correlation between alignment (n=336) and manipulate with a Spearman's Rho Correlation Coefficient of rs=0.203, (p=0.000). A positive correlation indicates that the more alignment was used, the more manipulate was used. Although there is a correlation, a Spearman's Rho Correlation Coefficient rs=0.203 is considered to be a very weak correlation, and is statistically significant.

TABLE 4.19 CORRELATIONS BETWEEN ALIGNMENT. 1

		Wellness	Manipulate
Alignment	Correlation Coefficient	0.178	0.203
	P-value	**0,001**	**0,000**
	N	336	336

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4.9.6 Vitalism

There is a correlation between vitalism (n=336) and practice-member with a Spearman's Rho Correlation Coefficient of rs=0.410, (p=0.000). A positive correlation indicates that the more vitalism was used, the more practice-member was used. A Spearman's Rho Correlation Coefficient rs=0.410 is considered to be a moderately strong correlation, and is statistically significant.

TABLE 4.20 CORRELATIONS BETWEEN VITALISM. 1

		Practice-M
Vital	Correlation Coefficient	0.410
	P-value	**0,000**
	N	336

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CHAPTER FIVE: DISCUSSION

5.1 Introduction

This chapter serves to discuss and interpret the results recorded in chapter 4. This chapter will refer to chapter 2 literature review to help explain what the results mean in relation to other studies that have been done.

5.2 Demographic Analysis

5.2.1 Provinces

Gauteng, KZN and the Western Cape (n=101) all had valid percentages of 30.1%. The Eastern Cape (n=17), North west (n=4) and Northern Cape (n=2) all had valid percentages of 5.1%, 1.2% and 0.6%, respectively. This is because Gauteng, KZN and the Western Cape are the three most populated provinces in South Africa. As much data from the other provinces was collected, but unfortunately not enough could be collected for equal comparisons.

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A study done by Johl, Yelverton and Peterson (2017) included a survey and researched the scope of chiropractic in South Africa. They found that the highest number of responses came from Gauteng (43.4%), KwaZulu-Natal (25.5%) and the Western Cape (18.9%). Although the percentages are not exactly the same as the results of this study, it does show that the three main provinces where chiropractors practice are Gauteng, KZN and the Western Cape. Their lowest numbers came from Mpumalanga (0.9%) and the North West (0.9%). This also confirms this study's findings that few chiropractors practice in Mpumalanga and in the North West.

5.2.2 Gender

The combined sample consists of male (n=169) and female (n=119) had valid percentages of 58.7% and 41.3%. Johl, Yelverton and Peterson's (2017) findings showed that 56.1% of respondents to their survey were males and 43.9% were females. These results confirm the gender distribution between male and female chiropractors that was found in this study.

The only statistically significant difference in gender distribution was for the use of the word manipulate. The word manipulate was used more by males (mean=2,07) than by females (mean=1.65) (p=0.032). Although not statistically significant, but still relevant for discussion, is that the only word that female chiropractors in South Africa use more that male chiropractors, is the word alignment. Most studies that have looked at the differences between male and female chiropractors have only looked at the amount of hours worked and the total amount of patients seen per week. Vollenweider, Peterson and Humphreys (2017) found that female chiropractors spend more time with their patients and more time on direct patient care. They also found that female chiropractors treated more patients with acute conditions, whereas male chiropractors treated more chronic conditions. No studies have been done on the use of chiropractic terminology between male and female chiropractors.

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5.2.3 Educational Institutes

Due to the fact that the study was done in South Africa, there will understandably be more chiropractors who have qualified at one of the two South African chiropractic educational institutes. DUT (n=111) and UJ (n=113) had a valid percentage of 44.8% and 45.6%, respectively. DUT's chiropractic department has been running for 31 years since it first opened in 1989. Wits Technikon (now the University of Johannesburg) opened its chiropractic department 4 years later in 1993 (CASA, 2020). This might be a possible explanation as to why there are more chiropractors who qualified at DUT. Chiropractic educational institutes in the USA (n=21) and UK (n=3) had valid percentages of 8.5% and 1.2%. Johl, Yelverton and Peterson (2017) found the most highly represented training facility in RSA was DUT (49.3%) followed by UJ (42.0%). Of the

remaining respondents, 8% represent Life Chiropractic College and University, Palmer College of Chiropractic, and the National University of Health Science.

5.3 Objective Data Analysis

The words adjustment, manipulate and wellness were the three most commonly used chiropractic-specific words found on South African chiropractors websites. The word adjustment was used 1106 times and had a mean of 3.29, with a maximum of 47. The word manipulate was used 611 times and had a mean of 1.82 with a maximum of 24. The word wellness was used 324 times and had a mean of 0.96 and a maximum of 11. Although this is a decimal, it is close to 1.00 and is relevant. South African chiropractors were found to use the word adjustment more than the word manipulate. As discussed in chapter two, the effects of an adjustment are largely mechanical, including a realignment of joint surfaces, an increase in joint mobility, a reduction of muscle spasm, and an improvement of posture and locomotion (Haldeman, Dagenals, Budgell, Grunnet-Nilsson, Hooper, Meeker, Triano, 2005). There are a number of other elements that could be involved. Some chiropractors would argue that an adjustment provides some type of a neurological or organic effect that is absent in the type of manipulation provided by other health-care professionals. However, published literature only accepts and recognizes the term manipulation, and not adjustment. The use of the word adjustment in South Africa therefore shows that even with all the evidence-based changes that have occurred, there are still many South African chiropractors who use a word that is not accepted by mainstream medical practitioners or by published academics.

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Young (2020) in a similar study done in Australia, also found the word adjust (-ing/-ment) to be the most commonly found word on Australian chiropractors' websites. He found adjust(−ing/−ment) to be the most commonly occurring term at 2249 total occurrences. When discussing the results of his study, Young (2020) came to the conclusion that "Strong emphasis on adjustment reduces chiropractic from a health-care profession with a the broad range of diagnostic and therapeutic capabilities to a single therapeutic intervention". Chiropractic is much more than just one therapeutic intervention, chiropractic-specific

terminology could be the cause to the confusion that surrounds what chiropractic is, what they treat, and how their personal beliefs shape their approach to a patient.

After the word adjustment, Young's (2020) results included wellness at 872, subluxation at 489, vital(−ism/−istic) at 158, and innate at 137.

5.3.1 Comparison Between Provinces

Adjustment in Gauteng had a mean of 3.77 and median of 2.00. Adjustment in KZN had a mean of 2.32. Adjustment in the Western Cape had a mean of 3.77 and median of 2.00. This data shows us that chiropractors in Gauteng and the Western Cape (mean=3.77) use the word adjustment more than in KZN (mean=2.32). This could be attributed to the specific chiropractic terminology used and taught at DUT and its effects on the whole province.

Wellness in Gauteng had a mean of 0.56. Wellness in KZN had a mean of 0.69. Wellness in the Western Cape it had a mean of 1.29. This data shows us that chiropractors in the Western Cape (mean=1.29) use the word wellness more than chiropractors in Gauteng (mean=0.56) and KZN (mean=0.69). This cannot be attributed to a specific chiropractic educational institute as there aren't any in the Western Cape.

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Manipulate in Gauteng had a mean of 1.78 and median of 1.00. Manipulate in KZN had a mean of 1.44. Manipulate in the Western Cape it had a mean of 2.08. This data shows us that chiropractors in the Western Cape (mean=2.08) use the word manipulate more than chiropractors in Gauteng (mean=1.78) and KZN (mean=1.44). If these results showed that Gauteng or KZN used the word manipulate the most, we might be able to attribute this to the University education being the cause, but because there is no chiropractic educational institute in the Western Cape, this could not be the case.

Gauteng used holism an average of 0.21 times per website versus KZN using it 0.45 and the Western Cape at 0.64 time per website. Gauteng and KZN used practice-member 0.00 time whereas the Western Cape used it 0.10 times per website.

5.3.2 Gauteng vs KZN

Adjustment (p=0.001), therefore the amount of times chiropractors in Gauteng used the word adjustment is more than that of chiropractors in KZN and is statistically significant.

5.3.3 Gauteng vs the Western Cape

Holism (p=0.000), therefore the amount of times chiropractors in the Western Cape used the word holism is more than that of chiropractors in Gauteng and is statistically significant.

Practice-member (p=0.013), therefore the amount of times chiropractors in the Western Cape used the word practice-member is more than that of chiropractors in Gauteng and is statistically significant.

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5.3.4 KZN vs the Western Cape

Adjustment (p=0.000), therefore the amount of times chiropractors in the Western Cape used the word adjustment is more than that of chiropractors in KZN and is statistically significant.

Practice-member (p=0,013), therefore the amount of times chiropractors in the Western Cape used the word practice-member is more than that of chiropractors in KZN and is statistically significant.

The Western Cape is the province with the highest amount of statistically relevant differences between their use of chiropractic-specific terminology. This includes statistically significant increases in the use of the words holism, practice-member and adjustment, compared to that of Gauteng and KZN. The reason for the increased use in terminology in the Western Cape is a complex one, because it cannot be attributed to one specific educational institute, since there are none in the Western Cape. This data might suggest that chiropractors who have a more holistic view and are more likely to use words like holism, practice-member or adjustment are drawn from the province that they studied in, to the Western Cape. This might suggest that the Western Cape is more accepting of holistic, vitalistic and alternative medical concepts.

A survey was done by Du Plessis (2013) to determine the attitudes towards complementary and alternative medicine (CAM) in Cape Town. Her analysis concluded that there is a significant interest in CAM in Cape Town. Another explanation for the increased use of chiropractic-specific terminology by chiropractors in the Western Cape could be a marketing approach. If it is know that there is an increase in CAM in a given area, it would be a clever marketing strategy to use specific words (holism or practice-member) that are associated with CAM, in order to draw more patients.

5.3.5 Comparison of Educational Institutes

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The only statistically significant difference in university distribution was for the use of the word adjustment. Adjustment was used more by UJ graduates (mean - 4,12) than by DUT graduates (mean – 3,24) (p=0,048). DUT received accreditation by the ECCE in 2009 and UJ in 2010. Although a small difference, it could contribute to the difference in the use of chiropractic-specific terminology by chiropractors who studied at UJ versus those from DUT.

5.4 Correlations

5.4.1 Years of Practice

A correlation was found between years of practice and the use of the words adjustment and alignment. A positive correlation indicates that the more years of practice, the more alignment was used. As stated above in chapter 2, there was a very important shift within the chiropractic world to only use evidence-based chiropractic-specific terminology in order to advance the profession.

The results discussed above show that the longer a chiropractor is in practice (the older he/she is) the more likely they are to use chiropractic-specific terminology. It is possible that these results could be attributed to the signing of the education collaborative document, which states that effective communication in a language that is clearly understood by all stakeholders in health-care should be used to better communicate between health-care teams. It also states that the teaching of vertebral subluxation complex as a vitalistic construct that claims that it is the cause of disease is unsupported by evidence, and its inclusion in a modern chiropractic curriculum in anything other than a historical context is inappropriate and unnecessary (Uj.ac.za., 2020). There is no mention of subluxation in the European council on chiropractic education (ECCE). The subluxation is not based on enough evidence, and is not reproducible, therefore the ability to reproduce it should not be included in any graduate's competency. DUT received accreditation by the ECCE in 2009 and UJ in 2010. Although a small difference, it could contribute to the difference in the use of chiropractic-specific terminology by chiropractors who studied at UJ versus those from DUT.

Recently qualified, younger chiropractors use chiropractic-specific terminology less because the educational institutes they studied at upheld the above statement.

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5.4.2 Subluxation

A positive correlation was found between the words subluxation and adjustment, alignment and manipulate. A positive correlation indicates that the more subluxation was used, the more alignment, adjustment and manipulate were used. Chapter two clearly outlines the history of why the word subluxation is problematic and why it should not be used in modern chiropractic literature. Although the words alignment, adjustment and manipulate are not as problematic, they are still considered as chiropractic-specific terminologies, and lose their value (are seen in a bad light) when associated with a word like subluxation. Chapter two discussed the four main arguments made for keeping the word subluxation, that being: professional identity, philosophical, technical, legal and accreditation (Keating *et al.*, 2005). This study concluded that whether its part of professional identity is relative to where you are from (Funk *et al.*, 2018), that subluxation is not part of the philosophy of chiropractic but, rather its history (Keating *et al.*, 2005), that evidence-based accreditation councils have abandoned the term subluxation (Funk *et al.*, 2018; Innes, Leboeuf-Yde and Walker, 2016) and that there really is no legal reason for its use.

The correlation between the words subluxation and alignment is an interesting as they have very separate individual meanings, but are used to convey the same concept. Although early chiropractors used x-rays to study spinal alignment to identify the location of a 'subluxated' or misaligned vertebrae (Jenkins, Downie, Moore and Simon, 2018), I believe modern chiropractors use alignment as an easy and lazy way to explain to a patient why they are about to manipulate a patient. Alignment-based chiropractic is an easy metaphor that chiropractors use to help a patient to easily and quickly understand what is wrong with them. We know this, as the clinical relevance of the alternations in alignment can be due to anatomical variation, the positioning of the patient during the taking of x-ray imaging, muscle spasms or even pain (Jenkins et al., 2018), and not due to mis-aligned vertebrae that can be 'manipulated back into place'.

Instead of alignment/subluxation based chiropractic, the model that looks at joint fixation/locking, intra-articular block, inter-articular adhesions, inter-discal block, muscle spasm, myofascial cycle, and periarticular

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fibrosis and adhesions (Haldeman, Dagenals, Budgell, Grunnet-Nilsson, Hooper, Meeker, Triano, 2005) should be understood and applied by chiropractors.

5.4.3 Holism

A positive correlation was found between holism, wellness and manipulate. A positive correlation indicates that the more holism was used, the more wellness and manipulate were used. Both the words holism and wellness are nonspecific, non-evidence-based words that do not add any value to the chiropractic profession. Taylor (2011) defines wellness care as: suitable treatment focused toward maintaining an ideal body function. Wellness care is used synonymously to represent the process of spinal manipulative therapy for an asymptomatic patient (Taylor, 2011). Holism within chiropractic emphasizes self-responsibility of patients for their health and the importance of mobilization of their health capacities, as supposed to just treating illness from the outside (Gatterman, 1995).

Both of the above definitions involve the concept of an ideal body function, or an ideal state of being. Both definitions suggest that instead of treating specific conditions with evidence-based treatment approaches, the chiropractor of holistic or wellness based practices provides prevention of nonspecific illness symptoms. The correlation between these two words confirms their similar meanings, in that if a chiropractor is likely to use one of these words, he or she is more likely to use the other.

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5.4.4 Vitalism

A correlation between the words vital(-ism/-istic) and practice-member was found. A positive correlation indicates the more vitalism was used, the more practice-member was used. A Spearman's Rho Correlation Coefficient 0.410** is considered to be a moderately strong correlation. Vitalistic concepts are nothing new to chiropractic and it have existed for years. The word practice-member is a rather new phenomenon that has occurred in the chiropractic world. As defined by Nardi (2012) "the term 'patient' isn't very fitting because as in medicine it insinuates a temporary nature. It gives the impression that our relationship is short term and predicated on something being 'wrong' with you. It implies the 'treatment' of symptoms and conditions, neither

of which we do. practice-member implies a relationship." According to the above definition, a chiropractor who uses the term practice-member does not believe that something is wrong with a patient, and doesn't treat symptoms or conditions.

As discussed in chapter two, vitalism within chiropractic context is the idea that if a vertebra is out of place there is an interruption of the flow of vital energy (innate intelligence) within the body, and that it is the cause of disease or pain in the body.

Once we have analysed the definitions of the above two words and really understand what is meant by each, we now better understand why there is a correlation between them. Neither of the words mentioned above align with science. There is no understanding of basic anatomy, human physiology or pathology. It is basically religious believes that have worked their way into a medical profession.

While vitalistic concepts remain within chiropractic, the profession will remain separated from mainstream health-care (Simpson and Young, 2020). This includes the use of words that are associated with vitalistic concepts, including the term practice-member.

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CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter serves to take all the relevant information from chapters four and five, summarize and conclude the results and discussions in order to conclude the outcome of this study.

6.2 Conclusion

The primary aim of this study was to calculate the prevalence of nine Chiropractic-specific words (Subluxation, Manipulate (-ion), Adjust (-ing/-ment), Holism (-tic), Alignment, Practice-member, Vital (-ism/-istic), wellness, and Innate Intelligence) on the websites of South African chiropractors. The secondary aim of this study was to analyse and compare other biographic elements including educational institute (universities), gender, years of practice and province. This allows us to compare the prevalence of chiropractic-specific terminology within each of the above demographic sub-headings.

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This study demonstrated that South African chiropractors use an average of at least two chiropractic-specific words on their websites. The words adjustment (-ing/-ment,) manipulate (-ion) and wellness were the three most commonly used chiropractic-specific words found on South African chiropractors' websites.

With regards to gender distribution, the only statistically significant difference was that the word manipulate was used more by male than by female chiropractors. With regards to the distribution between educational institutes, the only statistically significant difference was that UJ graduates used the word adjust (-ing/-ment) more than DUT graduates. With regards to provincial breakdowns, the statistically significant differences include: chiropractors in the Western Cape used the words holism and practice-member more that chiropractors in Gauteng, and use the words adjust (-ing/-ment) and practice-member more than

chiropractors in KZN. Chiropractors in Gauteng used the word adjust (-ing/-ment) more than chiropractors in KZN, and this is statistically significant.

This study also demonstrated the same correlations between words. There is a correlation between the years that a chiropractor has been in practice, and the use of the words adjust (-ing/-ment) and alignment. There is a strong correlation between chiropractors who use the word subluxation and adjust (-ing/-ment), a moderately strong correlation between chiropractors who use the words adjust (-ing/-ment) and alignment and a moderately strong correlation between chiropractors who use the words vitalism and practice-member.

In conclusion, this study found that all South African chiropractors on average use at least two chiropractic-specific words on their websites, that the more years of practice one has the more likely one is to use more chiropractic-specific terminology and that the younger recently graduated chiropractors use less chiropractic specific terminology. This indicates that evidence-based education has made a difference in the way chiropractors communicate, and how much they use chiropractic-specific terminology

6.3 Recommendations

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In order to achieve better and more definitive results in the future, various changes can be made. Some of these include the following:

- Some data was missing on websites regarding exactly which educational institutes some chiropractors studied at abroad. An improvement would be to use data from websites as well as to call the relevant chiropractors to find out at which educational institutes they studied.
- Years of practice was another missing data point. Phone calls should also be made in order to exactly find out how many years in practice each chiropractor has.

- Google searches will never be impartial to websites that have paid for advertising or have the most web traffic. An impartial search engine should ideally be used, although this might not ever be possible.
- Counting words on a website and keeping track on a spreadsheet opens up the possibility to miscounting and human error. An improvement would be to write an algorithm that automatically counts the words needed on a given website.

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APPENDIX A: ETHICAL WAIVER

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FACULTY OF HEALTH SCIENCES
RESEARCH ETHICS COMMITTEE

NHREC Registration: REC 241112-035

ETHICAL REVIEW WAIVER LETTER
(RECX 0.0)

Student/Researcher Name	Michael Pretorius	Student Number	201592209
Supervisor Name	Dr C. Yelverton	Co-Supervisor Name	N/A
Department	Chiropractic		
Qualification	M.Tech Chiropractic		
Research Title	THE PREVALENCE OF CHIROPRACTIC-SPECIFIC TERMINOLOGY ON SOUTH AFRICAN CHIROPRACTORS' WEBSITES		
Date	30 June 2020		

The research proposal with details above has been granted a waiver of the requirement to undergo ethical review. Please note the following:

1. This is not an ethical clearance letter. A waiver of the requirement to undergo ethical review means that the research proposal will not be reviewed, and thus cannot be approved ethically.

2. If it is envisaged at any point that the research methods will be amended, a Research Proposal Amendment Application Form (REC 8.0) must be completed and submitted to the REC Secretariat prior to the research being amended even if a waiver has been granted. Amendments to research may only be carried out once a new waiver or (if applicable) ethical clearance letter is issued. *See Section 13 of the REC Standard Operating Procedures*.

3. The requirement for ethical clearance renewal and closure is also waived.

The REC wishes you all the best for your studies.

Yours sincerely.

Prof. Christopher Stein
Chairperson: REC
Tel: 011 559 6564
Email: cstein@uj.ac.za

APPENDIX B: TURNITIN REPORT

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THE PREVALENCE OF CHIROPRACTIC-SPECIFIC TERMINOLOGY ON SOUTH AFRICAN CHIROPRACTORS' WEBSITES.

A research proposal presented to the Faculty of Health Sciences, University of Johannesburg, as partial fulfilment for the Master's degree in Technology, Chiropractic by

Michael Eloff Pretorius
(Student number : 201592209)

Supervisor: _____ Date: _____
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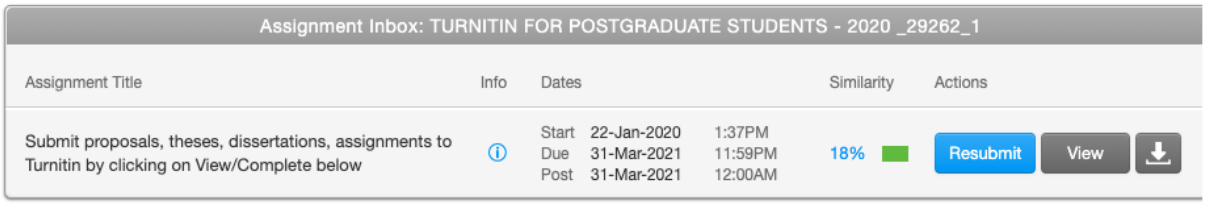

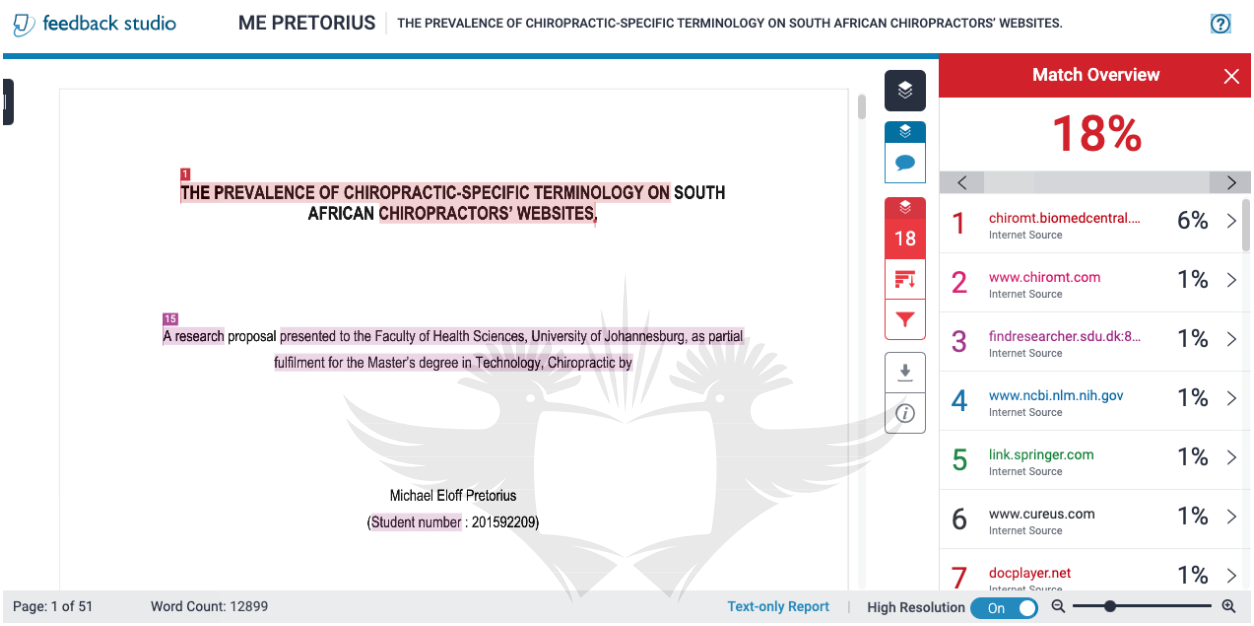

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